Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1 - 4 (Canceled)

5. (Previously Presented) A monitoring apparatus for monitoring polarization-mode dispersion and chromatic dispersion of optical signals in wavelength division multiplexing (WDM) optical networks, the monitoring apparatus comprising:

an optical distributor for distributing optical signals;

a first light receiver for photoelectrically converting the optical signals to measure a frequency band of the optical signals distributed by said optical distributor;

a second light receiver for photoelectrically converting the optical signals to measure an average power of the optical signals distributed by said optical distributor;

a filter for passing output signals of said first light receiver over the frequency band of interest for measuring;

a power meter for measuring signal power over the frequency band filtered by said filter;

an analog-to-digital (A/D) converter for converting analog signals from said first and second receivers into digital signals; and

a microprocessor for measuring average power of the optical signals by using the digital signals from said A/D converter and monitoring polarization-mode dispersion and chromatic dispersion using power values measured by said power meter;

wherein said power meter produces a maximum power value ($P(f)_{max}$) and a minimum power value ($P(f)_{min}$) of the signals outputted from said first light receiver according to a polarization scrambling technique, said maximum and minimum power values being defined as:

$$P(f)_{max} \propto \cos(\pi cDL(f/f_0)^2)$$

$$P(f)_{min} \propto [\cos^2(\pi f \Delta\tau)][\cos \pi cDL(f/f_0)^2)]$$

where c indicates a speed of light, D indicates a chromatic dispersion coefficient of an optical fiber in ps/km/nm, L indicates a length of the optical fiber, f indicates a frequency, and f_0 indicates an optical frequency of optical signals.

6. (Previously Presented) The monitoring apparatus of claim 5, wherein said microprocessor monitors the polarization-mode dispersion by a ratio of the maximum power value ($P(f)_{max}$) and the minimum power value ($P(f)_{min}$), which are measured by said power meter, and monitors chromatic dispersion by the maximum power value, said polarization-mode dispersion ($\Delta\tau$) and said chromatic dispersion (DL) being defined as:

$$\Delta\tau = \cos^{-1}(2\,P(f)_{min}/P(f)_{max}-1)/(2\pi f)$$

$DL \propto P(f)_{max}$.

7. (Previously Presented) The monitoring apparatus of claim 5, wherein said optical distributor is an optical coupler that extracts optical signals received at a constant rate.

8. (Previously Presented) The monitoring apparatus of claim 5, wherein said filter has a center frequency falling within the frequency band of data signals when the data signals are applied to the received optical signals.

9. (Previously Presented) The monitoring apparatus of claim 5, wherein a center frequency of said filter corresponds to a frequency of a high-frequency pilot tone when data signals and extra pilot tone signals are applied to the received optical signals.

10. (Currently Amended) <u>A monitoring apparatus for monitoring polarization-mode dispersion and chromatic dispersion of optical signals in wavelength division multiplexing (WDM) optical networks, comprising:</u>

<u>an optical distributor that distributes optical signals;</u>

<u>a first light receiver that photoelectrically converts the optical signals to measure a frequency band of the optical signals distributed by said optical distributor;</u>

a second light receiver that photoelectrically converts the optical signals to measure an average power of the optical signals distributed by said optical distributor;

a filter that passes output signals of said first light receiver over the frequency band of interest for measuring;

a power meter that measures signal power over the frequency band filtered by said filter;

an analog-to-digital (A/D) converter that converts analog signals from said first and second receivers into digital signals; and

a microprocessor that measures an average power of the optical signals by using the digital signals from said A/D converter and monitoring polarization-mode dispersion and chromatic dispersion using power values measured by said power meter;

wherein said power meter produces a maximum power value ($P\ (f)_{max}$) and a minimum power value ($P\ (f)_{min}$) of the signals outputted from said first light receiver according to a polarization scrambling technique, said maximum and minimum power values being defined as:

$$P(f)_{max} \propto \cos(\pi cDL(f/f_0)^2)$$

$$P(f)_{min} \propto [\cos^2(\pi f \Delta\tau)][\cos \pi cDL(f/f_0)^2)]$$

where c indicates a speed of light, D indicates a chromatic dispersion coefficient of an optical fiber in ps/km/nm, L indicates a length of the optical fiber, f indicates a frequency, and f_0 indicates an optical frequency of optical signals, and

~~The monitoring apparatus according to claim 5, wherein~~ said optical signals are modulated by a polarization scrambler to have a polarization state in every direction.

11. (Previously Presented) The monitoring apparatus according to claim 5, wherein the filter passes only over the frequency band of interest for measuring.

12-19. (Canceled)

20. (New) The monitoring apparatus of claim 10, wherein said microprocessor monitors the polarization-mode dispersion by a ratio of the maximum power value ($P(f)_{max}$) and the minimum power value ($P(f)_{min}$), which are measured by said power meter, and monitors chromatic dispersion by the maximum power value, said polarization-mode dispersion ($\Delta\tau$) and said chromatic dispersion (DL) being defined as:

$$\Delta\tau = \cos^{-1}(2\,P(f)_{min}/P(f)_{max}-1)/(2\pi f)$$

$$DL \propto P(f)_{max}.$$

21. (New) The monitoring apparatus of claim 10, wherein said optical distributor is an optical coupler that extracts optical signals received at a constant rate.

22. (New) The monitoring apparatus of claim 10, wherein said filter has a center frequency falling within the frequency band of data signals when the data signals are applied to the received optical signals.

23. (New) The monitoring apparatus of claim 10, wherein a center frequency of said filter corresponds to a frequency of a high-frequency pilot tone when data signals and extra pilot tone signals are applied to the received optical signals.

24. (New) The monitoring apparatus according to claim 10, wherein the filter passes only over the frequency band of interest for measuring.